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Docket No.: M4065.0788/P788
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Richard H. Tsai

Confirmation No.: 5841

Application No.: 09/648,403

Art Unit: 2612

Filed: August 24, 2000

Examiner: Ngoc-Yen T. Vu

For: P-TYPE RESET/READOUT CIRCUITRY
WITH N-TYPE PHOTODIODE FOR
RADIATION HARD APS

REQUEST FOR RECONSIDERATION

U.S. Patent and Trademark Office
220 20th Street S.
Customer Window, Mail Stop AF
Crystal Plaza Two, Lobby, Room 1B03
Arlington, VA 22202

Dear Sir:

The above-identified Application has been carefully reviewed in light of the Office Action dated July 15, 2004. Applicant respectfully requests reconsideration and allowance of the application in light of the following remarks. Claims 1-30 remain pending.

As an initial matter, Applicant notes that on the Office Action dated July 15, 2004, that the Attorney Docket Number was incorrect. The correct Attorney Docket Number for this application is: M4065.0788/P788. Applicant respectfully requests that the USPTO records be changed to reflect the correct Attorney Docket Number.

Claims 1-3, 6-8, 10-11, 13-16, and 17-27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,369,853 to Merrill et al. (“Merrill”) in view of U.S. Patent No. 5,757,008 to Akagawa et al. (“Akagawa”). The rejection is traversed and reconsideration requested.

The present invention relates to active pixel sensors formed in a p-type substrate and having an n-type photosensitive element and reset and readout circuits having p-type transistors. As such, independent claims 1, 10, and 14 each recite an n-type photosensitive element for producing an electrical signal and “a p-type source follower transistor for receiving said electrical signal at a gate thereof and for producing therefrom a pixel output signal.” None of the cited references, whether considered alone or in combination, teaches or suggests all of the elements found in the claimed invention.

For instance, Merrill teaches “a storage-pixel sensor and an array of storage-pixel sensors suitable for use in an active-pixel area-array image sensor employing an electronic shutter method.” Col. 2, lines 39-43. Merrill does not teach or suggest “a p-type source follower transistor for receiving said electrical signal at a gate thereof and for producing therefrom a pixel output signal” as recited by independent claims 1, 10, and 14. Instead, Merrill teaches the use of an “N-channel MOS source-follower transistor 192.” Col. 10, lines 14-15. In fact, Merrill specifically teaches away from the use of a p-type source follower transistor as claimed, stating “[t]he source follower output transistor 192. . . remains an N-Channel device since a p-channel MOS source follower transistor would not be active with its gate near the positive supply rail.” Col. 9, lines 20-23.

Akagawa does not cure this deficiency of Merrill. Specifically, Akagawa does not utilize a source follower transistor for reading out a signal from the photosensitive region. Rather, Akagawa teaches a Schottky diode 21-24 connected to a vertical switch 11, which connects the diode 21 to a vertical readout line 37. See Fig. 14 and accompanying text.

Thus, none of the cited references, whether considered alone or in combination, teaches or suggests all of the claim limitations recited by independent claims 1, 10, and 14. For at least these reasons, claims 1, 10 and 14 are allowable over the references of record, and reconsideration is requested.

Moreover, claims 2-3, 6-8, 11, 13, 15-16, and 17-27 each depend from one of independent claims 1, 10, or 14, and therefore contain each of the elements discussed above. Accordingly, for the reasons discussed above regarding the allowability of the independent claims, each of these dependent claims should be allowed as well. Reconsideration is therefore requested.

Claims 4-5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Merrill in view of Akagawa and further in view of U.S. Patent No. 6,252,218 to Chou (“Chou”). The rejection is traversed and reconsideration requested.

Claims 4-5 each depend from claim 1, and therefore they contain all of the limitations recited by claim 1. Regardless of whatever Chou teaches regarding an “image sensor in which photodiodes are laid out in a geometrically-efficient patter[n] for the purpose of increasing pixel density. . .,” Chou does not cure the deficiencies of Merrill and Akagawa discussed above. Specifically, Chou does not teach or suggest a “p-type source follower transistor,” as required by claims 4-5. Even assuming, *arguendo*, that there were some objective reasons or motivation for combining the cited references, of which there is none, the combination does not teach or suggest all of the claim limitations found in the rejected claims. For at least these reasons, claims 4-5 are allowable over the references of record.

Claims 9, 13, 18, and 28-30 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Merrill in view of Akagawa and further in view of U.S. Patent No. 5,881,184 to Guidash (“Guidash”). The rejection is traversed and reconsideration requested.

Claims 9, 13, and 18 each depend from one of independent claims 1, 10, and 14, and therefore contain each of the elements recited by these independent claims. Specifically, each of these claims recite “a p-type source follower transistor for receiving said electrical signal at a gate thereof and for producing therefrom a pixel output signal.” For whatever Guidash teaches about the use of a second reset circuit, Guidash does not cure the deficiencies of Merrill and Akagawa as discussed above regarding “a p-type source follower transistor” as recited by claims 9, 13, and 18. Even assuming, *arguendo*, that there were some objective reasons or motivation for combining the cited references, of which there is none, the combination does not teach or suggest all of the claim limitations found in the rejected claims. For at least these reasons, claims 9, 13 and 18 are allowable over the references of record.

Similarly, independent claim 28 recites “a p-type source follower transistor for receiving said electrical signal at a gate thereof and for producing therefrom a pixel output signal.” For all of the reasons given above regarding the allowability of claims 9, 13, and 18, independent claim 28 is also allowable. Claims 29 and 30 depend directly from claim 28 and therefore contain all of the limitations recited by claim 28. For at least these reasons, claims 29 and 30 are allowable over the references of record. Reconsideration of these claims is requested.

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In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Dated: October 12, 2004

Respectfully submitted,

By



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